MONTANA
GROUND WATER PLAN

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INTRODUCTION

The Montana Ground Water Plan was developed in response to concerns identified by citizens at public scoping meetings and as a result of a recommendation of the 1992 State Water Plan Section: Integrated Water Quality and Quantity Management. "The [DNRC] shall formulate and adopt and amend, extend, or add to a comprehensive, coordinated multiple-use water resources plan known as the "state water plan". The state water plan may be formulated and adopted in sections, these sections corresponding with hydrologic divisions of the state. The state water plan must set out a progressive program for the conservation, development, and utilization of the state's water resources and propose the most effective means by which these water resources may be applied for the benefit of the people, with due consideration of alternative uses and combinations of uses" (MCA 85-1-203). This effort also addresses a U.S. Environmental Protection Agency (EPA) recommendation for states to develop a comprehensive ground water protection program. A State Ground Water Planning Committee consisting of 22 ground water users, regulators, legislators, well drillers, and academicians identified a number of recommendations to assist citizens in preserving our aquifers to sustain current and future beneficial uses. A survey of almost 1,000 well owners, water interest groups, ground water discharge permit holders, and city and county governments was conducted to guide plan formation. The following three ground water components are the result—Protection, Education, and Remediation.

The Ground Water Planning Committee identified a number of recommendations within the Ground Water Plan to address those areas and programs that needed to be strengthened. Also, the Ground Water Planning Committee developed the Montana Ground Water Strategy (see Appendix A). The Ground Water Strategy differs from the Ground Water Plan in that it provides recommendations for achieving an overall management framework for sustaining the state's ground water resources. As in the Ground Water Plan, these recommendations were also categorized under the same three headings—Protection, Education, and Remediation. The Ground Water Work Group, which is a subgroup of the Montana Watershed Coordination Council, will be responsible for overseeing implementation of the Ground Water Strategy while the Montana Department of Natural Resources and Conservation (DNRC) will have primary responsibility for reviewing implementation of the Ground Water Plan.

Under the Montana Water Use Act, ground water is defined as "any water that is beneath the ground surface." To secure a right to use ground water at a rate ~~of~~ greater than 35 gallons per minute (gpm), or more than 10 acre-feet per year (afy), requires a permit from DNRC. More than one well or spring manifolded together also requires a permit if the combined withdrawals exceed 35 gpm or 10 afy. For a ground water use of less than these amounts, an appropriator simply needs to file a notice of completion with DNRC within 60 days of developing a well or spring. The applicant will then receive a water use certificate. These permits and certificates secure the appropriator's right to use ground water.

Approximately 217 million gallons each day (mgd) is withdrawn from aquifers underlying Montana. In 1990, ground water withdrawals were used for irrigation (90 mgd or 41.5 percent); public water supply and rural domestic use (66 mgd or 30.4 percent); industry (30 mgd or 13.8 percent); livestock (16 mgd or 7.4 percent); and mining (15 mgd or 6.9 percent)[USGS, 1993]. More than 50 percent of Montana's citizens rely on ground water for drinking and household use.

~~Western Montana aquifers are generally characterized by high yields and low dissolved solids while the opposite is true in Eastern Montana.~~ The quality and availability of ground water in Montana vary greatly across the state. Aquifers in western Montana are typically intermontane, alluvial valley aquifers that readily yield large quantities of high quality water to shallow wells. Residents in eastern Montana obtain ground water from the unconsolidated, shallow alluvial valley aquifers and glacial till aquifers, and consolidated sedimentary formations. The eastern Montana aquifers typically yield less water than those of the west, and the water is more mineralized. The water in some eastern aquifers is suitable only for livestock consumption. At a few locations, improper waste disposal or land use practices have caused ground water contamination. Montana's Water Quality Act (WQA) is designed to protect, maintain, and improve the quality of Montana's water resources. The WQA (MCA 75-5-101 to 641) contains a stringent nondegradation policy and establishes water quality standards to protect human health and aquatic life. A permit system is administered under the WQA to control discharges of wastes to surface and ground water. Other statutes have been passed to control mineral extraction and processing, hazardous and solid waste management, underground storage tank installation and monitoring, pesticide and fertilizer handling, and municipal and domestic sewage disposal—all of which may threaten the quality of ground water.

Unanticipated spills and releases may cause contamination of ground water ~~in~~ at almost any location in Montana, particularly along transportation routes. Abandoned or inactive sites where ground water is contaminated or where wastes have been improperly disposed of are being discovered in many locations. More attention is focused on ground water pollution from mining and industry, improper animal waste management, and certain farming practices which cause saline seeps.

The Ground Water Assessment Program ~~(see Appendix B for program Fact Sheet)~~ is currently installing monitoring wells at selected sites in Montana to document water table levels and baseline water quality characteristics. ~~Appendix C describes~~ Various agencies mentioned in this document that collect data and address ground water concerns. They include the Natural Resource Information System (NRIS), Montana Bureau of Mines and Geology (MBMG), Ground Water Information Center (GWIC), Water Resources Center, and the Interagency ~~Water Resources Coordinating Committee~~ Montana Watershed Coordination Council. ~~A catalog of ground water education programs is provided in Appendix D.~~

POLICY STATEMENT

It is the policy and practice of Montana to protect and improve the quality and quantity of its ground water resources. The Montana Ground Water Plan sets forth recommendations for improving public and private management of the State's ground water with a goal of sustaining current and future uses. The sequence of options recommended under each issue reflects a priority ranking for needed actions.

ISSUES, OPTIONS, AND RECOMMENDATIONS

Subsection A: Ground Water Protection Strategy

Goal: To protect and improve the quality and quantity of Montana's ground water resources in order to sustain current and future uses and to protect public health.

Purpose: To ~~facilitate~~ provide government, corporations, and individuals with the best possible information and guidance for making decisions ~~decision-making~~ that improve and protect Montana's ground water.

Over 50 percent of all Montana citizens, which includes 95 percent of rural residents, depend on ground water for their domestic water supply. In most cases Montanans enjoy a wholesome and plentiful supply of ground water. Yet where ground water has been contaminated, the public has become increasingly aware that the cost of cleanup generally exceeds the financial ability of most communities and state government. Therefore, citizens need new ways to help prevent ground water contamination and protect this vital resource. Between 1986 and 1994 the state made considerable progress in establishing programs to protect our ground water. This section of the Montana Ground Water Plan is aimed at coordinating the implementation of these programs and determining where there are gaps or duplication of services.

Issue 1 - Ground Water Resource and Uses: *Inventory, classify, and monitor ground water to determine existing conditions and appropriate levels of protection.*

Because available data indicate that many of Montana's surface water basins are over appropriated, the Montana Legislature closed several of them to future appropriations. These basins include the Upper Missouri River basin, the Jefferson and Madison River basins, the Teton River basin, the Upper Clark Fork River basin, and the Beaverhead and Red Rock River basins. As a result of these surface water closures, more people are turning to ground water to satisfy their water needs. The State needs to ensure that these ground water appropriations do not adversely affect surface water flows or uses. Baseline information on the status of ground water resources is needed to make better ground water management decisions and to define the role surface water interaction plays in ground water pollution. Further, there is a need for better coordination and systematic evaluation of the many ground water protection programs dispersed among various federal, state, and local agencies.

Options Recommended

1. The Board of Water Well Contractors (Board), in cooperation with DNRC and the Montana Bureau of Mines and Geology (MBMG), should provide well drillers with training on accurate reporting of well locations on well logs. The Board and DNRC should provide training for drillers, consultants, and researchers on a standard method to describe aquifer materials on well logs and in reports.

2. Where appropriate, regional assessments conducted under the MBMG's Ground Water Assessment Program should consider the ~~amount of stream flow attributable to ground water~~ interrelationship between surface and ground water.

3. The Legislature should ~~provide adequate~~ evaluate whether existing funding mechanisms are adequate to fulfill the requirements of the Ground Water Assessment Act. Any restructuring of Resource Indemnity Trust (RIT) funding mechanisms should include Ground Water Assessment Act implementation as a high priority.

4. The Montana Department of Environmental Quality (DEQ), DNRC, Board of Water Well Contractors, Board of Oil and Gas Conservation, and Montana Department of Agriculture should ~~mandate that~~ encourage all ~~agencies collecting regulatory~~ persons collecting and submitting water samples for regulatory purposes, ~~and request that all collectors of nonregulatory private water samples, include~~ to provide the EPA's minimum data requirements (the sample shall be clearly marked with the township, range, and section, or latitude and longitude of the well, altitude of the well, and the method it was determined, the county name, the date and time taken, the depth of the well, the depth of the screened open interval, and the static water level) for the purpose of building a water quality data base. (DEQ language)

5. State agencies should conduct regular evaluations of their ground water protection programs and the Montana Environmental Quality Council (EQC) should publish a summary report every ~~five~~ four years that describes the status of the State's ground water resources.

6. DNRC, through the basin planning process, should: (1) perform a comprehensive evaluation of existing ground water uses and plans for future ground water uses, (2) assist in local ground water planning, and (3) estimate the quantities of ground water available to meet existing and future needs.

7. DNRC, under the Renewable Resource Development Grant Program, and DEQ, under the Clean Water Act Section 319 Nonpoint Source Grant Program, when considering ground water applications should give priority to those applications that either protect ground water and ground water recharge or define the role of irrigation, septic systems, constructed wetlands, and sewage lagoons in ground water recharge and discharge, particularly where there is a potential connection to surface waters. (DEQ language)

Options Considered but Not Recommended

1. Establish preferred methods for ~~pump~~ production testing new wells in Montana's aquifers.

2. Introduce a bill into the Montana Legislature that amends the Resource Indemnity Trust Tax to allocate $666,000 annually to the Ground Water Assessment Program.

3. Coordinate the establishment of ground water classifications on tribal lands with tribal governments so that these classifications are compatible with those on non-tribal lands in accordance with ARM ~~16.20.1002~~ 17.30.1002.

Issue 2 - Sources of Pollution: *Identify those activities and substances, including naturally occurring substances, that pollute ground water in Montana.*

To help identify and track ground water contaminants, site information collected by various agencies should be ~~compiled into a central location~~ available and linked through NRIS for easy access and comparison. In addition, those activities that affect the flow or chemical characteristics of ground water should be assessed. Similarly, the biological components of ground water need better definition. Two other sources of ground water pollution, abandoned wells and bore holes, need to be identified and mitigated.

Options Recommended

1. DEQ should evaluate the long-term effect on ground water from documented ground water pollution, including mining, agriculture, business, industry and development, and waste management. (DEQ language)

2. State agencies that manage ground water data should work to assure data bases are compatible across programs.

3. The Montana University System (MUS) and county and state agencies with ground water programs should work with the NRIS to incorporate data bases into a statewide Geographic Information System (GIS). ~~and ensure that these data bases are compatible and accessible for comparisons across programs.~~

~~2~~4. DNRC and DEQ should encourage the ~~federal~~ U.S. Natural Resource Conservation Service (NRCS) to provide funding to locate and properly seal abandoned water wells and bore holes in accordance with applicable requirements.

~~4~~5. DNRC (under the Renewable Resources Development Grant Program) and DEQ (under the Clean Water Act Section 319 Nonpoint Source Grant Program) when considering ground water projects, should give ~~due consideration~~ priority to grant applications that assess how bacteria and viruses are introduced and transported through aquifer materials and that determine the fate and transport of agricultural chemicals in ground water, particularly where there is a potential connection to surface water.

6. State and local agencies should encourage ~~contaminant source~~ inventories of potential contaminant sources in communities that use ground water for drinking water.

Options Considered but Not Recommended

1. Create a Montana Pollution Prevention computer network which: (1) compiles information on contaminants, Best Management Practices (BMPs), and alternative methods of preventing ground water pollution, and (2) facilitates exchange of information between agencies and individuals working in the field.

Issue 3 - Management: *Develop ways to help communities define and protect their ground water.*

Better strategies should be developed to strengthen the ability of state and local agencies to effectively implement their ground water protection programs. More importantly, these strategies should encourage and empower local citizens to solve their own ground water problems.

Options Recommended

1. DEQ should develop and/or provide information on BMPs and Water Quality Protection Practices including waste minimization, directly to permittees, local agencies, financial institutions, and to the general public through entities such as the county libraries and computer networks such as the State Bulletin Board and the Internet.

2. DEQ should ~~cooperate with~~ encourage and support local collection centers to assure proper disposal of automotive wastes and household hazardous wastes.

3. DEQ should explore and develop options for ~~granting variances to regulations which inhibit innovative and cost-effective management methods at the local level (e.g. allowing effective alternative septic systems for new subdivisions)~~ supporting innovative advancements in technology and cost-effective ground water management at the state and local levels.

4. The Montana Watershed Coordination Council should encourage cooperation between state agencies, and Local Water Quality Districts, and local watershed planning groups to address ground water issues at the local level.

5. DEQ should consider requiring waste minimization programs for all applicants for DEQ permits when there is a potential for groundwater impacts.

Options Considered but Not Recommended

1. DNRC should evaluate the use of professional arbitrators, mediators, and staff of the Montana Consensus Council to address ground water disputes.

~~2.~~ ~~The Montana Watershed Coordination Council should expand cooperation between state agencies and Local Water Quality Districts to address ground water issues at the local level.~~

~~3~~2. – ~~DEQ should require waste minimization programs for major industries that apply for ground water pollution control permits.~~ (Note: this option has been modified and moved to Recommendation 3-5)

42. DEQ should identify and address those management practices that contribute to ground water contamination. (See 3-4 above)

~~5~~3. DEQ should evaluate water conservation practices to assure they will not cause water quality problems.

~~54~~. Encourage the Legislature to fund the Regional Pesticide Waste Collection Program.

65. Encourage creative solutions to issues and costs related to installing water and sewage collection systems to improve ground water contamination areas that now use septic systems and wells.

Subsection B: Ground Water Education Strategy

Goal: To engage Montanans of all ages in personal or public action that supports wise ground water use and management.

Purpose: To develop and support effective ground water education strategies and programs that include information, training, and action.

Ground water education is critical for informed ground water protection. Protection requires prevention.~~, which is~~ This can only be accomplished by ~~humans~~ people who are ~~well~~ aware of the impacts their activities can have on ground water ~~under the land surface.~~ Informational materials, education, technical assistance, and training on basic ground water characteristics and processes are essential prerequisites to successful ground water policy implementation. This subsection of the Montana Ground Water Plan identifies educational assistance programs and information necessary for all components of the plan to be effective.

Issue 4 - Public Awareness: *Expand public awareness of ground water.*

Many Montanans may not be aware that more than 50 percent of Montanan's domestic water supplies come from ground water sources, and that their actions can pollute those sources. There is a real need to expand public awareness of issues related to ground water. Some activities that were once considered harmless are now known to threaten ground water (e.g., septic systems, agricultural runoff, and using waste oil for dust suppression). Citizens need information on ground water as a renewable resource; that it can be overused or permanently contaminated; that the costs of pollution cleanup can be prohibitive, and in some cases, not feasible; and that pollution prevention is easier than clean-up.

Several ground water education programs have the goal of elevating public awareness and understanding of ground water. For example, Project WET (Water Education for Teachers) Montana and the state's ~~Wellhead~~ Source Water Protection Program train youth educators and students, and Local Water Quality Districts and the Montana Watercourse's "Know Your Watershed" workshops provide community education opportunities that include general ground water information. A statewide survey of public understanding and knowledge about ground water will help educators develop and target their educational efforts most effectively.

Options Recommended

1. State agencies with ground water protection programs should coordinate with each other and educational groups to develop and deliver educational programs to ensure that every Montanan is aware of the importance of ground water.

2. The MUS, including the Extension Service, the Water Resources Center, the Montana Watercourse, and the Environmental Studies Program should conduct statewide survey(s) to determine ground water education needs and to assess public understanding and knowledge of actions being taken to protect ground water in Montana.

3. Local ground water protection programs, such as Local Water Quality Districts and Conservation Districts, should conduct surveys and inform citizens of the benefits and responsibilities of personal and community actions to protect their ground water.

Options Considered But Not Recommended

1. Identify and stratify target audiences, based on age, demographics, occupation, education, geographic location (e.g., curricula for teachers, Extension faculty, cattle feedlots, irrigators, industry, etc.).

2. Develop appropriate awareness tools (e.g. limited focus, limited content).

3. Identify and utilize the appropriate place, delivery mechanism, and price investment by audience, time, effort, and promotional angle.

Issue 5 - Understanding and Making Knowledgeable Decisions: *Increase public knowledge of ground water characteristics and processes, and prepare citizens to take positive action to protect and enhance Montana's ground water.*

A basic knowledge and understanding of ground water is necessary to make informed personal and public choices about ground water use and management, and to avoid land use practices that can adversely impact aquifers. Ground water education and information resources should target audiences (e.g. private well-owners and septic system owners) to prepare citizens to protect ground water and to manage their systems responsibly. Ground water seminars should be conducted for city and county decision makers to equip local leaders with the knowledge they need to institute appropriate protection strategies. Citizens who understand the economic, ecological, and health costs of contaminated ground water, who know that the cleanup of ground water can be prohibitively expensive, and who see the connection between conservative uses of ground water and a sustained supply, are citizens prepared for responsible management of ground water resources.

A number of ground water education programs in Montana~~, described in Appendix D,~~ currently work to improve public understanding and knowledge of ground water attributes and processes. These include the programs of the MUS Extension—Drinking Water Treatment, Farm*A*Syst, Office of Urban Pest Management, Private Pesticide Applicator Certification Training,

Pollution Prevention for Small Businesses, and Solid Waste Institute. Other educational programs are provided by Conservation Districts, Local Water Quality Districts, the Montana Environmental Training Center, Program of Shared Operation & Management (POSOM), Project WET Montana and the Montana Watercourse, MUS Water School, Wellhead Protection Programs of the Montana Rural Water Systems, and DEQ Planning Prevention and Assistance Division. The ongoing work of the MBMG Ground Water Assessment Program will contribute valuable information, ~~and data to inform the aforementioned~~ data, and interpretations that will assist these educational programs. Additionally, NRIS at the State Library will soon make available a Montana Ground Water Atlas showing the state's major aquifer systems (in hard-copy and electronic forms). It is critical that these efforts receive financial support to ensure their effectiveness in realizing the following recommendations.

Options Recommended

Ground water education programs in Montana, implemented by the agencies and programs listed above, should include a focus on the following recommendations:

1. ~~Teach~~ Inform citizens how aquifer characteristics affect ground water's vulnerability to various types of pollutants.

2. Develop, refine, and deliver local, regional, and state programs to ensure that Montanans understand ground water and aquifer attributes, uses, problems, relationships to surface water, and protection measures.

3. ~~Teach~~ Inform citizens about the economic, ecological, and health consequences of ground water pollution. This may include describing the benefits of preventing ground water pollution versus the costs of ground water clean-up and providing models of successful ground water protection strategies.

4. Inform citizens about activities that can pollute ground water, and ways that contaminants reach ground water (e.g., agricultural, industrial, mining, and municipal sources as well as abandoned wells, bore holes, sumps, injection wells, etc.).

5. Inform citizens about water conservation practices and new technologies to protect ground water.

Options Considered But Not Recommended

1. Develop and deliver a planned, coordinated, multi-part educational program to elevate the knowledge-level of targeted audiences directly involved with ground water.

~~2. Target private well owners by developing and promoting periodic license renewal and continuing education requirements.~~

~~3~~2. Focus educational efforts on actions that can be taken by individuals, groups, or organizations to protect and reclaim ground water.

Issue 6 - Technical Assistance, Training, and Action: *~~Advance~~ Enhance citizens' abilities to take action to prevent contamination and cleanup ground water problems using present technology.*

Citizens will benefit from ready access to technical assistance and training that will ~~advance~~ enhance their skills and abilities to use current technology to prevent pollution and cleanup contaminated ground water. A variety of programs exist in Montana ~~(see Appendix D)~~ which provide training and technical assistance for targeted audiences. Water and wastewater operators, specifically, have access to technical training and assistance through several programs. The ~~Wellhead~~ Source Water Protection Program of the Montana Rural Water Systems offers information for city governments about wellhead protection, and provides classes on wellhead protection and well-construction for interested citizens, local officials, water and wastewater operators and others. Additionally, the DEQ ~~Wellhead~~ Source Water Protection Program offers a voluntary program emphasizing local control, education, and training for professionals working with drinking water systems to protect public water supplies. Existing programs need to be well-supported and actively and routinely coordinated to assure their continued effectiveness in the future.

Options Recommended

~~4~~1. ~~The Montana Interagency Water Resources Coordination Committee and~~ The Montana Watershed Coordination Council should ~~form a~~ continue its water education subcommittee ~~to~~ and help coordinate ground water education programs.

~~1~~2. Ground water education programs in Montana should provide educators with technical support and training to facilitate student involvement in community action projects which protect, sustain, or clean-up Montana's ground water.

~~2~~3. Ground water education programs in Montana should ~~teach~~ inform citizens and industry how they can initiate and lead efforts to protect and clean-up ground water, drawing on agency resources and assistance.

~~3~~4. Ground water education programs in Montana should provide continuing education to businesses, individuals, and agencies to encourage the use of appropriate technology to enhance, protect, and clean-up Montana's ground water.

5. State government personnel should be ~~assigned more regular field contacts and provide~~ responsible for ~~providing more~~ continuing and increasing ground water education through local ground water workshops and contacts with individual water users.

6. Government agencies should provide coordinated access to sources of information on ground water laws, regulations, technologies, clean-up standards, economic incentives, and available assistance.

Options Considered But Not Recommended

1. Provide research opportunities to support businesses, individuals, and agencies who are directly involved with the use of appropriate technology to enhance and protect Montana's ground water.

2. Identify ground water education centers of excellence and recommend educational entities or agencies to provide informational resources to businesses that show how water quality improvements can help the "bottom-line" and enhance value.

Subsection C: Ground Water Remediation Strategy

Goal: To eliminate or reduce harmful impacts to human health and the environment posed by ground water contamination.

Purpose: To coordinate regulatory activities to effectively address clean-up of ground water contamination.

Legislation passed in the last ten years established or enhanced a variety of regulatory programs for solid waste landfills, underground fuel storage tanks, mines, agricultural chemicals, and several other sources of pollution. Due to pollution liability concerns, property assessments to document the degree of contamination that may be present at a site are standard for commercial property sales. As a result of the increased regulatory requirements, as well as heightened public awareness about pollution, numerous sites with ground water contamination have been discovered in Montana. This section of the Montana Ground Water Plan is aimed at ensuring that responsible and appropriate action is taken at those sites.

Issue 7 - Administration and Standards: *Ensure that implementation of Montana and federal environmental regulations and standards accomplish site cleanup consistently and thoroughly. (DEQ language)*

Administrative procedures and cleanup standards differ ~~between~~ under Montana's various environmental laws ~~and regulations.~~ The actions ~~an industry~~ responsible parties ~~is~~ are required to take ~~initiate~~ in the event of ~~response to a pollution incident are not~~ a pollutant release should be dependent upon the severity of the threat to human health ~~or~~ and the environment. ~~Instead~~ Currently, they are dictated by which regulatory program has jurisdiction over the pollutant release. A spill of ~~weed killer~~ a herbicide at a mine could result in a violations ~~of at least five different Montana environmental statutes~~ of environmental regulations including, but not limited to: the Montana Water Quality Act, Montana Pesticides Act, Montana Agricultural Chemical Ground Water Protection Act, Resource Conservation and Recovery Act, Comprehensive Environmental Cleanup and Redevelopment Act, and Hard Rock Mine Reclamation Act. Although ~~T~~these laws serve to protect ~~public~~ human health and the environment, ~~however, implementation of the regulations need to be more consistent and predictable~~ they must be implemented more consistently. (DEQ language)

Options Recommended

1. DEQ, MDA, Montana Department of Transportation (MDT), and DNRC should establish an Interagency Remediation Committee (Committee) with representatives of relevant programs. The Committee would establish regular meeting schedules to review newly reported contamination sites and encourage a timely and consistent response. The Committee would concentrate its efforts on complex sites and solving generic recurring remediation concerns. The Committee would be organized and led by the DEQ Remediation Division. (DEQ language)

2. The Legislature should amend Montana Tax Law by adding a property classification that would provide an incentive for people to purchase, clean-up, and redevelop contaminated property. The incentive should be structured in a way to be sure that only persons with no prior connection to the property and who did not contribute to the contamination receive the incentive. (DEQ language)

~~3.~~ ~~The Legislature should amend the Hard Rock Mine Reclamation Act to require a reclamation bond for all mining and milling operations including small mining and milling operations excluded from permitting and bonding requirements.~~ (Note: this recommendation has been moved to "Options Considered but Not Recommended" per DEQ request)

~~4~~3. The DEQ should amend the Montana Ground Water Pollution Control System Rules (ARM17.30.1045) to require reporting of spills. The rules would clearly identify when, how, and to whom spills are to be reported and set state guidelines for minimum quantities that must be reported. The DEQ should write rules to require the reporting of historic contamination when it is discovered. The rules should clearly identify when, how, and to whom discoveries of historic contamination are to be reported. (DEQ language)

~~5.~~ ~~The Legislature should amend the Hard Rock Mine Reclamation Act to require a financial assurance test for mine permit applicants showing their ability to implement water remediation measures.~~ (Note: this recommendation has been moved to "Options Considered but Not Recommended" per DEQ request. This recommendation would be difficult to implement given that operating permits for mines are transferable. As is often the case with mining operations, the applicant and the ultimate operator of a mine may be different entities. While the operator of a mine may change, the reclamation bond is intended to serve as a continuing financial guarantee.)

~~6~~4. DEQ, MDA, MDT, and DNRC should establish state policies to develop and consistently apply water quality and soil standards for clean-up of new sites and use of standards applied to historic contamination. The policies may allow for site specific flexibility based on risk, use, toxicity, exposure, costs/benefits, and public input. (DEQ language)

~~7.~~ ~~Government agencies should coordinate consistent response procedures to address spills and other unanticipated releases that may threaten ground water.~~ (Note: This recommendation has been moved to "Options Considered but Not Recommended" per DEQ because this is already being done.)

~~8.~~ ~~The Legislature should amend the Water Quality Act to remove the cap on the Water Quality Rehabilitation Account so that all penalties collected accumulate in the account to fund remediation and program activities.~~ (This account was abolished by the 1995 legislature)

~~9~~5. ~~The Legislature should amend the Water Quality Act to establish criteria defining an emergency and to grant DEQ the authority to issue emergency discharge permits for up to 60 days for remediation purposes.~~ The DEQ should establish policies and procedure to consistently and quickly handle permits and/or waivers to permits for urgent situations where short-term discharges will occur for remediation purposes only. (DEQ language)

~~10~~6. DEQ should investigate and inventory ground water nonpoint source pollution and the need for clean-up.

7. The DEQ should educate government, business, and individuals about water quality standards and the application of the standards. (New recommendation per DEQ because already being done)

8. State and local agencies should encourage inventories of potential contaminant sources in communities that use ground water for drinking water. The DEQ should assist Public Water Supplies to delineate areas that contribute to water supplies and assess potential threats through the Source Water Delineation and Assessment Program and Wellhead Protection Program. (New recommendation per DEQ)

Options Considered but Not Recommended

1. Standardize cleanup levels among remediation programs.

2. Investigate/inventory ground water nonpoint source pollution and the need for cleanup.

3. The Legislature should amend the Metal Mine Reclamation Act to require a reclamation bond for all mining and milling operations including small mining and milling operations excluded from permitting and bonding requirements. (Note: Reclamation bonds are required for mills and all major mines.)

4. The Legislature should amend the Metal Mine Reclamation Act to require a financial assurance test for mine permit applicants showing their ability to implement water remediation measures. (See old recommendation 7-3)

5. Government agencies should coordinate consistent response procedures to address spills and other unanticipated releases that may threaten ground water. (This is addressed in Recommendation 7-5)

Issue 8 - Inventory and Characterize Contaminated Sites: *Develop a system to identify, catalog, and characterize contaminated sites in order to focus the state's resources.*

Montana does not have a comprehensive inventory system to track the location or to evaluate the status of contaminated sites. An inventory system would benefit potential property buyers or existing property owners by making it easier, through contact with one system, to determine if any state agencies have identified existing or potential pollution at a particular site. The state cannot ensure compliance and oversee clean-up at all sites, therefore, a comprehensive inventory would assist agencies in determining the severity of pollution at specific locations relative to other sites for prioritization purposes.

Options Recommended

1. NRIS should create and maintain a statewide inventory network that tracks the location of contaminated sites regulated by DEQ, Montana Department of Agriculture (MDA), ~~and~~ DNRC, and Local Water Quality Districts. Each agency should contribute consistent information to create and maintain the network.

2. DEQ, MDA, MDT, and DNRC should ~~report to~~ regularly share information on contaminated sites and clean-up activities at those sites through the Interagency Remediation Committee. The agencies should initially describe how each program sets priorities and determine the types of information and frequency of reporting needed. At a minimum, the agency reports should include a listing of any new sites discovered and plans for remediation. For those identified as significant to the Committee, ~~The agency~~ reports should also include: (1) the status of ground water contamination ~~sites and action at those sites; (2) an explanation of how each program prioritizes sites;~~ (~~3~~2) an evaluation of the effectiveness of clean-up activities; and (~~4~~3) ~~an examination of remediation and containment methods to gauge whether cross-media contamination is occurring~~ data necessary to assess the potential of cross media contamination.

Options Considered but Not Recommended

1. Prioritize contaminated ground water areas for remediation based on use, toxicity, exposure, costs/benefits, and cumulative effects.

Issue 9 - Research and Technology: *Support waste recycling and new pollution clean-up and containment methods.*

Montana's citizens and remediation programs would benefit from new research and methods for ground water clean-up. Research and the development and implementation of new technologies are necessary steps to solving pollution problems that exist today and preventing pollution in the future. Developing new technologies and new solutions requires some risk that must be balanced with the potential benefits of the new technologies.

Options Recommended

1. DEQ should establish a framework for evaluating and implementing innovative technologies for remediating ground water contamination. The framework could include, but not be limited to, independent data collection, testing under Montana conditions, repeatable experimental results by independent researchers, peer review, performance monitoring, and contingency provisions in the case of failure of the innovation.

Options Considered but Not Recommended

1. It is the policy of the State of Montana to encourage the development and use of innovative technologies for remediating water contamination.

2. Promote recycling and reusing wastes recovered from ground water remediation sites where appropriate.

3. Support research on new clean-up technologies including those designed to assist natural purifying processes and plume management.

4. Evaluate pollution clean-up and containment methods to assure cross-media contamination will not occur.

5. Establish a link between research and remediation needs.

PLAN IMPLEMENTATION

Recommendations for Legislative Action

The Legislature should ~~provide adequate~~ evaluate whether existing funding mechanisms are adequate to fulfill the requirements of the Ground Water Assessment Act. Any restructuring of Resource Indemnity Trust (RIT) funding mechanisms should include Ground Water Assessment Act implementation as a high priority. *(Issue 1, Recommendation 3)*

The Legislature should amend Montana Tax Law by adding a property classification that would provide an incentive for people to purchase, clean-up, and redevelop contaminated property. The incentive should be structured in a way to be sure that only persons with no prior connection to the property and who did not contribute to the contamination receive the incentive. *(Issue 7, Recommendation 2)*

The DEQ should amend the Montana Ground Water Pollution Control System Rules (ARM 17.30.1045) to require reporting of spills. The rules would clearly identify when, how, and to whom spills are to be reported and set state guidelines for minimum quantities that must be reported. The DEQ should write rules to require the reporting of historic contamination when it

is discovered. The rules should clearly identify when, how, and to whom discoveries of historic contamination are to be reported. *(Issue 7, Recommendation 3)*

~~The Legislature should amend the Hard Rock Mine Reclamation Act to require a reclamation bond for all mining and milling operations including small mining and milling operations excluded from permitting and bonding requirements (Issue 7, Recommendation 3).~~

~~The Legislature should amend the Hard Rock Mine Reclamation Act to require a financial assurance test for mine permit applicants showing the mine owner's ability to implement water remediation measures (Issue 8, Recommendation 5)~~

~~The Legislature should amend the Water Quality Act to remove the cap on the Water Quality Rehabilitation Account so that all penalties collected accumulate in the account to fund remediation and program activities (Issue 8, Recommendation 8).~~

~~The Legislature should amend the Water Quality Act to establish criteria defining an emergency and to grant DEQ the authority to issue emergency discharge permits for up to 60 days for remediation purposes only (Issue 8, Recommendation 9).~~

Recommendations for Administrative Action

The Board of Water Well Contractors, in cooperation with DNRC and MBMG, should provide well drillers with training on accurate reporting of well locations on well logs. The Board and DNRC should provide training for drillers, consultants, and researchers on a standard method to describe aquifer materials on well logs and in reports. *(Issue 1, Recommendation 1)*

Where appropriate, regional assessments conducted under the MBMG's Ground Water Assessment Program should consider the ~~amount of stream flow attributable to ground water~~ interrelationship between surface and ground water. *(Issue 1, Recommendation 2)*

DEQ, ~~should mandate that all regulatory water samples, and request that all private water samples~~ DNRC Board of Water Well Contractors, Board of Oil and Gas Conservation, and Montana Department of Agriculture should ~~mandate that~~ encourage all ~~agencies collecting~~ ~~regulatory~~ persons collecting and submitting water samples for regulatory purposes, ~~and request that all collectors of nonregulatory private water samples, include~~ to provide EPA's minimum data requirements describing sample location for purposes of building a water quality data base. *(Issue 1, Recommendation 4)*

State agencies should conduct regular evaluations of their ground water protection programs and the EQC should publish a summary report every ~~five~~ four years that describes the status of Montana's ground water resources. *(Issue 1, Recommendation 5)*

DNRC, through the basin planning process, should: (1) perform a comprehensive evaluation of existing ground water uses and plans for future ground water uses, (2) assist in local

ground water planning, and (3) estimate the quantities of ground water available to meet existing and future needs. *(Issue 1, Recommendation 6)*

DNRC, under the Renewable Resource Development Grant Program, and DEQ, under the Clean Water Act Section 319 Nonpoint Source Grant Program, ~~should give due consideration to grant applications that either protect ground water and ground water recharge or define the role irrigation, septic systems, constructed wetlands, and sewage lagoons play in ground water recharge and discharge~~ when considering ground water applications should give priority to those applications that either protect ground water and ground water recharge or define the role of irrigation, septic systems, constructed wetlands, and sewage lagoons in ground water recharge and discharge, particularly where there is a potential connection to surface waters. *(Issue 1, Recommendation 7)*.

~~DEQ should evaluate the long-term effect on ground water from documented ground water pollution associated with coal and hard rock mining.~~ DEQ should evaluate the long-term effect on ground water from documented ground water pollution, including mining, agriculture, business, industry and development, and waste management. ~~DEQ should establish a policy for preventing identified impacts and for providing corrective action.~~ *(Issue 2, Recommendation 1)*

The MUS and county and state agencies with ground water programs should work with NRIS to incorporate data bases into a statewide GIS. ~~and ensure that these data bases are compatible and accessible for comparisons across programs~~ . *(Issue 2, Recommendation 3)*

DNRC and DEQ should encourage the ~~federal~~ U.S. Natural Resource Conservation Service (NRCS) to provide funding to locate and properly seal abandoned water wells and bore holes in accordance with applicable requirements. *(Issue 2, Recommendation 4)*

DNRC, under the Renewable Resources Development Grant Program, and DEQ, under the Clean Water Act Section 319 Nonpoint Source Grant Program, ~~should give due consideration to grant applications that assess how bacteria and viruses are introduced and transported through aquifers~~ when considering ground water projects, should give ~~due consideration~~ priority to grant applications that assess how bacteria and viruses are introduced and transported through aquifer materials and that determine the fate and transport of agricultural chemicals in ground water, particularly where there is a potential connection to surface water. *(Issue 2, Recommendation 5)*

DEQ should develop and/or provide information on BMPs and Water Quality Protection Practices including waste minimization, directly to permittees, local agencies, financial institutions, and to the general public through entities such as the county libraries and computer networks such as the State Bulletin Board and the Internet. *(Issue 3, Recommendation 1)*

DEQ should ~~cooperate with~~ encourage and support local collection centers to assure proper disposal of automotive wastes and household hazardous wastes. *(Issue 3, Recommendation 2)*

DEQ should explore and develop options for ~~granting variances to regulations which inhibit innovative and cost-effective management methods at the local level (e.g. allowing effective~~

~~alternative septic systems for new subdivisions)~~ supporting innovative advancements in technology and cost-effective ground water management at the state and local levels. *(Issue 3, Recommendation 3)*

State agencies with ground water protection programs should coordinate with each other and educational groups to develop and deliver educational programs to ensure that every Montanan is aware of the importance of ground water. (Issue 4, Recommendation 1)

Local ground water protection programs, such as Local Water Quality Districts and Conservation Districts, should conduct surveys and inform citizens of the benefits and responsibilities of personal and community actions to protect ground water. (Issue 4, Recommendation 3)

The MUS, including Extension Service, Water Resources Center, Montana Water Course, and the Environmental Studies Program, and other ground water education programs in Montana, should include a focus on the following recommendations:

Conduct statewide surveys to determine ground water education needs, and to assess public understanding and knowledge of actions being taken to protect ground water in Montana. *(Issue 4, Recommendation 2)*

~~Teach~~ Inform citizens how aquifer characteristics affect ground water's vulnerability to various types of pollutants. *(Issue 5, Recommendation 1)*

Develop, refine, and deliver local, regional, and state programs to ensure that Montanans understand ground water attributes, uses, problems, relationships to surface water, and protection measures. *(Issue 5, Recommendation 2)*

~~Teach~~ Inform citizens about the economic, ecological, and health consequences of ground water pollution. This may include describing the benefits of preventing ground water pollution versus the costs of ground water cleanup and providing models of successful ground water protection strategies. *(Issue 5, Recommendation 3)*

Inform citizens about activities that can pollute ground water, and ways that contaminants reach ground water (e.g., agricultural, industrial, mining, and municipal sources as well as abandoned wells, bore holes, sumps, injection wells). *(Issue 5, Recommendation 4)*

Inform citizens about water conservation practices and new technologies to protect ground water. *(Issue 5, Recommendation 5)*

Provide educators with technical support and training to facilitate student involvement in community action projects which protect, sustain, or clean-up Montana's ground water. *(Issue 6, Recommendation 2)*

Teach citizens and industry how they can initiate and lead efforts to protect and clean-up ground water, drawing on agency resources and assistance. *(Issue 6, Recommendation 3)*

Provide continuing education to businesses, individuals, and agencies to encourage the use of appropriate technology to enhance, protect, and cleanup Montana's ground water. *(Issue 6, Recommendation 4)*

~~The Montana Interagency Water Resources Coordination Committee and~~ The Montana Watershed Coordination Council should form a continue its water education subcommittee to and help coordinate ground water education programs. *(Issue 6, Recommendation 1)*

State government personnel should be ~~assigned more regular field contacts and provide~~ responsible for ~~providing more~~ continuing and increasing ground water education through local ground water workshops and contacts with individual water users. *(Issue 6, Recommendation 5)*

Government agencies should provide coordinated access to sources of information on ground water laws, regulations, technologies, clean-up standards economic incentives, and available assistance. *(Issue 6, Recommendation 6)*

DEQ, MDA, MDT, and DNRC should establish an Interagency Remediation Committee (Committee) with representatives of relevant programs. The Committee would establish regular meeting schedules to review newly reported contamination sites and encourage a timely and consistent response. The Committee would concentrate its efforts on complex sites and solving generic recurring remediation concerns. The Committee would be organized and led by the DEQ Remediation Division. *(Issue 7, Recommendation 1)*

~~The Committee should recommend a state policy to participating agencies on consistent use of~~ DEQ, MDA, MDT, and DNRC should establish state policies to develop and consistently apply water quality and soil standards for clean-up of new sites and use of standards applied to historic contamination. The policies may allow for site-specific flexibility based on risk, use, toxicity, exposure, costs/benefits, and public input. *(Issue 7, Recommendation 4)*

~~The Legislature should amend the Water Quality Act to establish criteria defining an emergency and to grant DEQ the authority to issue emergency discharge permits for up to 60 days for remediation purposes.~~ The DEQ should establish policies and procedure to consistently and quickly handle permits and/or waivers to permits for urgent situations where short-term discharges will occur for remediation purposes only. *(Issue 7, Recommendation 5)*

DEQ should investigate and inventory ground water nonpoint source pollution and the need for clean-up. *(Issue 7, Recommendation 6)*

The DEQ should educate government, business, and individuals about water quality standards and the application of the standards. (Issue 7, Recommendation 7)

State and local agencies should encourage inventories of potential contaminant sources in communities that use ground water for drinking water. The DEQ should assist Public Water Supplies to delineate areas that contribute to water supplies and assess potential threats through the Source Water Delineation and Assessment Program and Wellhead Protection Program. *(Issue 7, Recommendation 8)*

NRIS should create and maintain a statewide inventory network that tracks the location of contaminated sites regulated by DEQ, Montana Department of Agriculture (MDA), ~~and~~ DNRC, and Local Water Quality Districts. Each agency should contribute consistent information to create and maintain the network. *(Issue 8, Recommendation 1)*

DEQ, MDA, MDT, and DNRC should ~~report to~~ regularly share information on contaminated sites and clean-up activities at those sites through the Interagency Remediation Committee. The agencies should initially describe how each program sets priorities and determine the types of information and frequency of reporting needed. At a minimum, the agency reports should include a listing of any new sites discovered and plans for remediation. For those identified as significant to the Committee, ~~The agency~~ reports should also include: (1) the status of ground water contamination ~~sites and action at those sites; (2) an explanation of how each program prioritizes sites; (3~~2) an evaluation of the effectiveness of clean-up activities; and (~~4~~3) ~~an examination of remediation and containment methods to gauge whether cross-media contamination is occurring~~ data necessary to assess the potential of cross media contamination.*(Issue 8, Recommendation 2)*

~~Government agencies should coordinate consistent response procedures to address spills and other unanticipated releases that may threaten ground water .*(Issue 8, Recommendation 7)*~~

DEQ should establish a framework for evaluating and implementing innovative technologies for remediating ground water contamination. The framework could include, but not be limited to, independent data collection, testing under Montana conditions, repeatable experimental results by independent researchers, peer review, performance monitoring, and contingency provisions in the case of failure of the innovation. *(Issue 9, Recommendation 1)*

APPENDIX A - Montana Ground Water Strategy

GROUND WATER PROTECTION STRATEGY

Goal: To protect and improve Montana's ground water resources in order to sustain current and future uses that are in the public interest.

Purpose: To recommend a set of actions to improve public and private management of Montana's ground water.

Ground Water Resources and Uses: Inventory and classify ground water to determine appropriate level of protection.

1. Determine the location, characteristics, water quality and quantity, and areas of recharge and discharge of Montana's aquifers.
2. Determine existing ground water uses, project the ways ground water will be used in the future and the amounts needed, and compare future needs to ground water availability.
3. Determine the vulnerability of Montana's aquifers and classify ground water use and quality. Use this information to determine the level of protection.
4. Monitor both ground water quality and quantity, establish baseline information and trends, and evaluate the success of the ground water programs.

Sources of Pollution: Find out what activities and substances pollute ground water in Montana.

5. Identify existing and potential point and nonpoint sources of ground water pollution. Also identify structures (examples: abandoned wells, bore holes, sumps, injection wells) that provide conduits for pollutants to reach ground water.
6. Identify types of pollutants and their characteristics. Describe the ways these pollutants interact with water and the hazards these pollutants pose to water users.
7. Determine what causes contamination and take appropriate action.

Management: Develop ways to help communities protect our ground water.

8. Evaluate and provide for the allocation of water and the protection of existing water uses.
9. Develop BMPs to protect ground water quality and quantity.
10. Look for innovative methods of management that do not require new laws and regulations but emphasize cost-effectiveness and fairness to all water users.
11. Provide cost-effective methods for dispute resolution (alternatives to courts).
12. Establish a policy of community-based resource management for the protection of ground water with government providing structure and assistance (through laws, regulations, and resources) so communities can address local ground water issues.
13. Encourage pollution prevention and identify ways to make it profitable.
14. Encourage water conservation practices and new technologies to protect ground water (example: tax incentives).

GROUND WATER EDUCATION STRATEGY

Goal: To engage citizens in personal or public action that supports wise ground water use and management.

Purpose: To develop effective ground water education strategies that include information and training.

Public Awareness: Expand public awareness of ground water.

15. Develop and deliver programs and information materials to insure that every Montanan has an awareness of the importance of ground water to the people, economy, wildlife and sustainability of Montana.
16. Inform citizens of the results and the benefits of personal and community action to protect our ground water.
17. Use surveys to determine education needs, and to assess public understanding, knowledge and action being taken to protect ground water in Montana.

Knowledgeable Decisions and Action: Increase public knowledge of ground water characteristics and processes, and prepare citizens to take positive action to protect and enhance Montana's ground water.

18. Develop and deliver programs and information materials to insure that Montanans acquire a working knowledge of ground water attributes, uses, problems and protection measures.
19. Teach citizens about types of pollutants and their characteristics, including hazards they pose, and how they interact with water.
20. Inform citizens about activities that can pollute ground water, and things that may provide conduits for contaminants to reach ground water aquifers (examples: abandoned wells, bore holes, sumps, injection wells).
21. Teach citizens how they can participate in community and government efforts to protect and clean-up ground water.
22. Instruct citizens about the comparative costs and benefits of the prevention of ground water pollution vs. the clean-up of ground water contamination.
23. Inform citizens about water conservation practices and new technologies to protect ground water.
24. Educate citizens about the use of BMPs.
25. Coordinate ground water education programs.

Technical Assistance and Training: Advance citizens' abilities to take action to prevent contamination and clean-up ground water problems using present technology.

26. Provide continuing education and research opportunities to businesses, individuals and agencies to facilitate the use of appropriate technology to enhance and protect Montana's ground water.
27. Develop and deliver ground water education materials and programs describing successful or model ground water protection, management and clean-up efforts.
28. Provide a central information system for use by the public, businesses, and agencies to access laws, regulations and ground water information, and personnel to answer questions regarding technologies and procedures.

GROUND WATER REMEDIATION STRATEGY

Goal: To reduce or eliminate harmful impacts to human health and the environment posed by contamination.

Purpose: To mitigate existing or potential impacts of ground water contamination by source clean up, containment, monitoring, or replacement with an alternate water resource.

Prioritization: Develop a system to focus the state's resources on the most threatening contamination sites.

29. Create a state-wide inventory and mapping system of contamination sites.
30. Prioritize cleanup sites and activities using criteria of use, toxicity, exposure, cost, and benefit.
31. Evaluate status and effectiveness of clean up activities.

Administration and Standards: Ensure that implementation of government rules and regulations are accomplishing pollution site cleanup in a fair and complete way.

32. Establish state cleanup standards for soils, surface water, and ground water. Allow for site specific flexibility based on risk, use, toxicity, exposure, cost, and benefit criteria.
33. Standardize cleanup levels among remediation programs.
34. Evaluate and establish consistent emergency response, reporting and cleanup procedures to address spills and other unanticipated releases.
35. Institute incentives for reclaiming contaminated sites.
36. Provide authority for DEQ to require bonds for reclamation and remediation of potential water contamination problems at sites with water discharge permits.
37. Allocate sufficient funding for enforcement of existing water quality laws and maintenance of ground water quality.
38. Establish an interagency management team to consolidate and/or coordinate state oversight of ground water cleanup activities and state response to water pollution incidents.
39. Work with responsible parties to expedite cleanup of contaminated sites. Streamline cleanup work plan review process and allow for emergency or temporary discharge permits to facilitate cleanup.
40. Investigate/inventory ground water nonpoint source pollution and the need for cleanup.
41. Develop a program to coordinate and address contaminated sites currently not covered under existing regulatory programs.

Research and Technology: Support waste recycling and new pollution cleanup and containment methods.

44. Promote recycling and reusing of wastes recovered from ground water remediation sites where appropriate.
45. Support research on new cleanup technologies including those designed to assist natural purifying processes and plume management.